Program for International Student Assessment International Data Explorer Help Guide

Contents

PISA International Data Explorer Help Guide

I. Background on the Program for International Student Assessment (PISA) and the PISA International Data Explorer (IDE)

The Program for International Student Assessment (PISA) International Data Explorer (IDE) is a web-based application for accessing data from the 2006 PISA, supported by the U.S. National Center for Education Statistics (NCES). PISA is a system of international assessments that focus on 15-year-olds' capabilities in reading literacy, mathematics literacy, and science literacy. PISA also includes measures of general or cross-curricular competencies such as learning strategies. PISA emphasizes functional skills that students have acquired as they near the end of mandatory schooling. PISA is organized by the Organization for Economic Cooperation and Development (OECD), an intergovernmental organization of industrialized countries. Begun in 2000, PISA is administered every 3 years. Each administration includes assessments of all three subjects, but assesses one of the subjects in depth. The major subject area assessed was reading literacy in 2000, mathematics literacy in 2003, and science literacy in 2006, with the cycle repeating again in 2009 with reading literacy as the major subject area.

Which assessment can I explore?

> **PISA Reading Literacy:** In 2006, the reading literacy scale included items of varying difficulty that represent the range of topics covered in the PISA reading framework. PISA defines reading literacy as "an individual's capacity to understand, use and reflect on written texts, in order to achieve one's goals, to develop one's knowledge and potential and to participate in society."
>
> **PISA Mathematics Literacy:** In 2006, the mathematics scale included items of varying difficulty that represent the range of topics covered in the PISA mathematics framework. PISA defines reading literacy as "an individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgments and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen."
>
> **PISA Science Literacy:** In 2006, the combined science literacy scale includes items from three subscales: identifying scientific issues, explaining phenomena scientifically, and using scientific evidence.

Since science literacy was the major domain in 2006, subscales are also identified for this subject area. They are as follows:

Identifying scientific issues includes recognizing issues that are possible to investigate scientifically; identifying keywords to search for scientific information; and recognizing the key features of a scientific investigation.

Explaining phenomena scientifically covers applying knowledge of science in a given situation; describing or interpreting phenomena scientifically and predicting changes; and identifying appropriate descriptions, explanations, and predictions.

Using scientific evidence includes interpreting scientific evidence and making and communicating conclusions; identifying the assumptions, evidence, and reasoning behind conclusions; and reflecting on the societal implications of science and technological developments.

SOURCE: Organization for Economic Cooperation and Development. (2006). *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006*. Paris: Author.

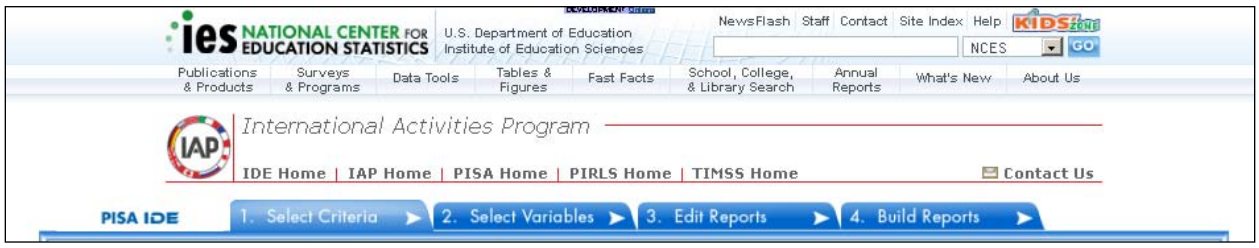
II. General Overview

There are four general steps for exploring PISA data using the PISA IDE (see exhibits 1 and 2). Each step is described in more detail starting on page 7.

Exhibit 1. General overview for using the IDE

1. Select Criteria: Choose your measure(s) and jurisdiction(s).	**2. Select Variables:** Select at least one variable from the selection of categories and subcategories.	**3. Edit Reports:** Preview how your data will look and edit your report format options and statistics options as desired.	**4. Build Reports:** Retrieve the data, make charts and graphs, save, and print reports.

Exhibit 2. Introduction to the IDE environment



III. Computer Requirements for IDE

- Screen resolution should be 1024 x 768 pixels.
- Browsers: Internet Explorer (IE) version 6 or higher (IE7 is recommended). For rendering and scrolling pages with large tables, Firefox 2.0 is faster than IE7 (FireFox 3.0 or higher is recommended).
- Enable JavaScript and pop-ups in your browser.
- IDE requires Flash version 9.0.115 or higher (download Adobe Flash Player at http://get.adobe.com/flashplayer/.
- Exports of files to Microsoft Office require Office 2003 or later.
- Exports of files to PDF can be read with Adobe Acrobat Reader.
- Screen reader software should be Jaws 8.0 or higher.

If you encounter an error, please send us the details through **Contact Us** (located in the upper right portion of the screen on each page of the IDE website). When writing, include your browser version and operating system version, and as many other details as possible. Be sure to provide an e-mail address so that we can contact you.

IV. Steps to Explore Data

To create your own custom tables, charts, and graphs, follow these steps when using the PISA IDE.

1. Select Criteria
2. Select Variables
3. Edit Reports
4. Build Reports

1. Select Criteria

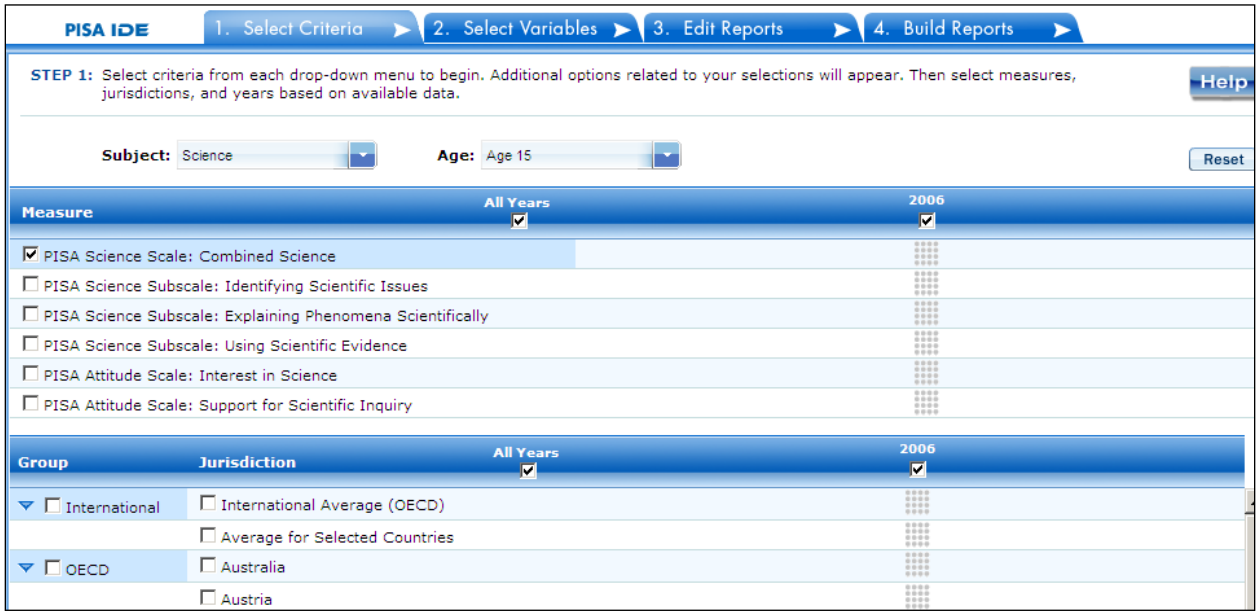
A. Overview

Your data query in the PISA IDE begins on the **Select Criteria** screen (see exhibit 3).

Select a **Subject** from the drop-down menu. Once the screen resets, you can choose one or more **Measures** and **Jurisdictions** for the data you wish to view or compare.

Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to cancel your selections and begin again.

Exhibit 3. Selecting criteria



B. Choose Subject

Under **Subject**, you have the choice of **Mathematics**, **Reading**, or **Science**. Once a subject is chosen, the screen resets and you can select a **Measure**(s) and **Jurisdiction**(s).

C. Choose Measure

After choosing a subject, you can choose between the composite (combined scale) and/or any of the subject's subscales. However, subscales are only available for a subject area that was a major domain that year. Note that the combined scale is the default.

For PISA 2006 data, note that Science is the only subject for which subscales are available; only composite scales are available for PISA Mathematics and Reading.

D. Choose Jurisdiction

With your measure selected, next choose at least one **Jurisdiction.**

Jurisdictions are found under the following **Groups**: **OECD** and **Non-OECD.** There is also a **Group** category called **International,** with options to display the **International Average (OECD)** and the **Average for Selected Countries.** Please note that selecting **International Average (OECD)** or **Average for Selected Countries** increases the frequency of receiving an error message in the **Build Reports** step due to the high volume of information contained in these groups.

The general procedures for selecting one or more jurisdiction are as follows:

1. When the blue arrow to the left of the group name is pointed down, the jurisdictions in that group are open (i.e., shown below) and can be selected. If you click the checkbox next to the group name (e.g., "OECD"), you will select all the jurisdictions within that group. If desired, uncheck the group name to de-select all.
2. Click the checkboxes next to specific jurisdictions that you are interested in, or uncheck those jurisdictions that you wish to de-select.
3. If you want to close a group (for example, close the list of OECD countries in order to readily see the non-OECD jurisdictions), click the blue arrow next to the group name. For the closed group, the blue arrow points to the right instead of pointing down and showing the group components (see exhibit 4).

Exhibit 4. Choosing jurisdictions

Be advised that closing the group will not de-select your choices.

To continue in the IDE, click the **Select Variables** button at the bottom of the page or the tab at the top of the page to go to the next screen.

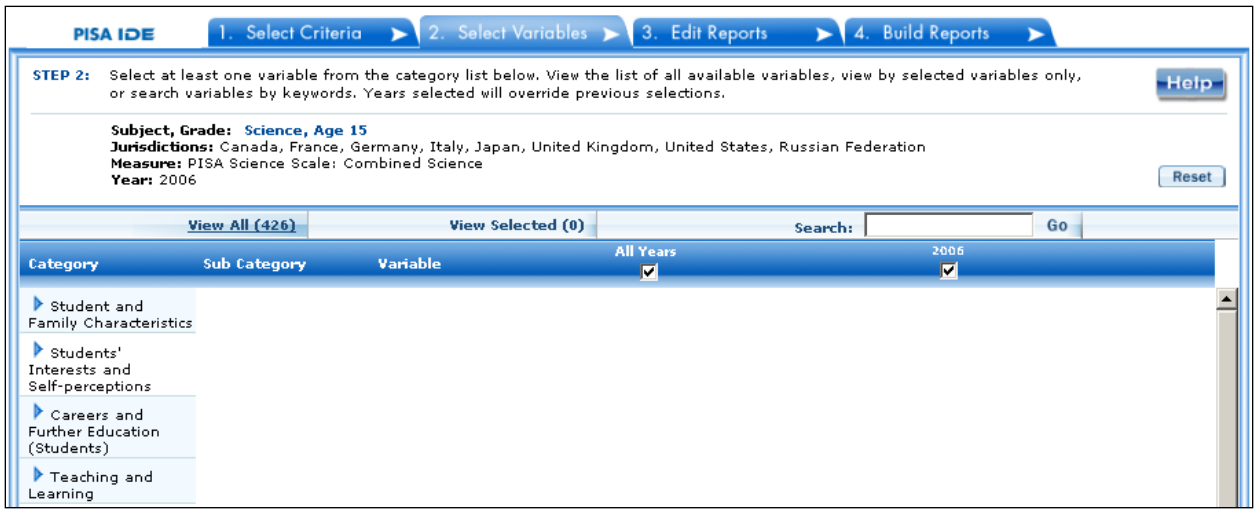
2. Select Variables

A. Overview

Step 2, **Select Variables,** can only be accessed after choosing criteria at step 1, **Select Criteria**.

To continue your data query and edit a report, *you must choose at least one variable on this screen.* You can browse for variables using the **Category** and **Sub Category** lists, or by using the **Search** function (see exhibit 5)**.** You can return to this screen to change variable selections at any time.

Exhibit 5. Select variables overview



B. Search Using Category and Subcategory Lists

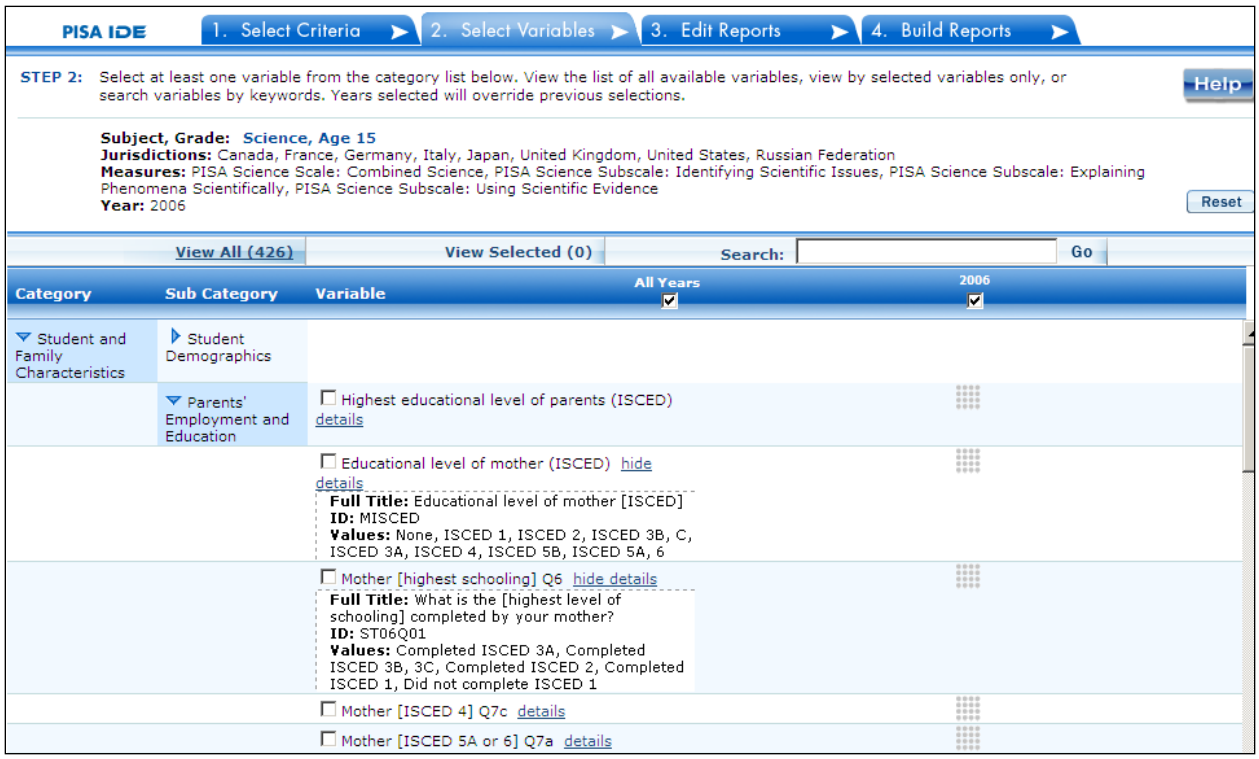
Choose at least one variable on this screen for your report. One way to do this is to search for variables using the **Category** and **Sub Category** lists. If you don't wish to choose from any of the specified categories and subcategories, then select **All students.**

The variables shown are tied to the criteria you selected at step 1 (**Measure** and **Jurisdiction**), which are indicated at the top of the screen. To change any of these criteria, return to step 1, **Select Criteria**.

To browse for variables, get details about them, select them, and view them:

1. Click the blue arrows to open and close categories and subcategories of variables (see exhibit 6).
2. Click **details** or **hide details** to show or hide the full title of a given variable, the PISA ID, and the values (i.e., variable labels). Note that some variables have the same or similar short titles, but comparing details will show you how the variables differ. See the example in exhibit 6 below, which shows the composite variable for the educational level of mother (MISCED) and an item from the student background questionnaire pertaining to mother's highest level of schooling completed (ST06Q01).
3. Click the checkbox next to a variable to select it for your analysis/report. You will see the count increase next to **View Selected**.
4. Click the **View Selected** tab to see the variables you have chosen. To return to the full list of variables by category, click the **View All** tab.

Exhibit 6. Select variables using category and subcategory lists



When you have selected the variable(s) you want to include, continue by clicking the **Edit Reports** button at the bottom of the page or the tab at the top of the page to go to the next screen.

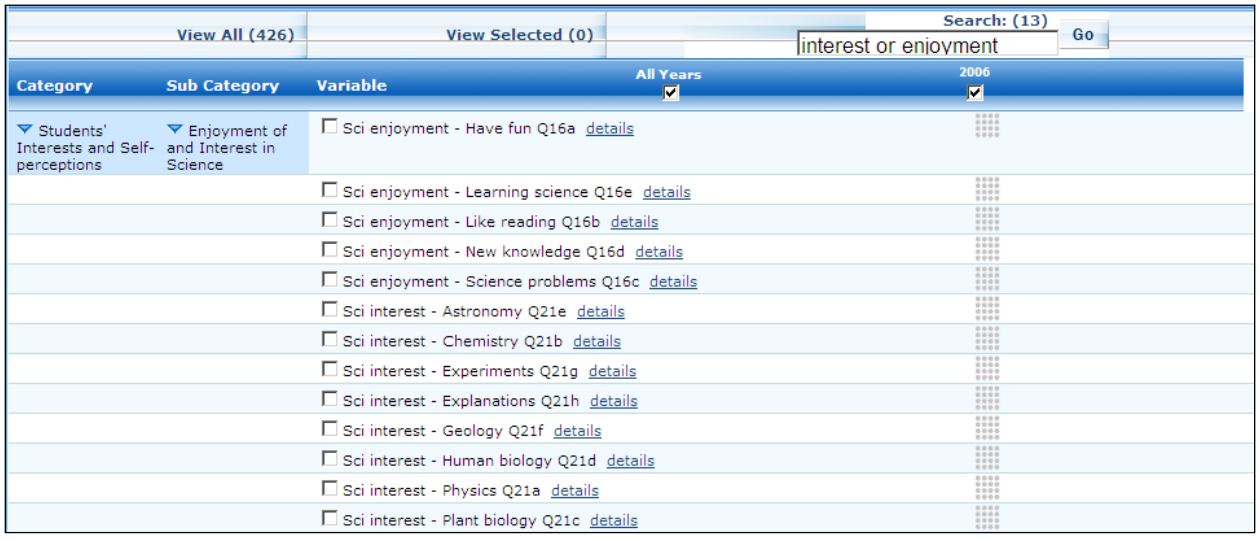
C. Search Function

The second way to search for variables is to use the **Search** function on the **Select Variables** screen.

Type a term in the **Search** box and click **Go** (or hit 'Enter' on your keyboard) to find variables by keywords in the question and/or details for the variable (see exhibit 7). If you use multiple keywords, "and" is assumed. Also narrow your search using "or," "not," "and not," or "near." The search function operates on an exact phrase if it is contained in quotes. The variable(s) that include the search term(s) in the question or its details will be listed.

See section B. Select Variables: Search Using Category and Subcategory Lists for information on how to get details about variables, selecting variables, and viewing variables.

Exhibit 7. Select variables using the search function



When you have selected the variable(s) you want to include, continue by clicking the **Edit Reports** button at the bottom of the page or the tab at the top of the page to go to the next screen.

3. Edit Reports

A. Overview

You can access step 3, **Edit Reports,** after choosing criteria at step 1, **Select Criteria**, and choosing variables at step 2, **Select Variables**.

At this step, you can

- preview and edit the layout of your reports;
- copy reports or create new reports based on the variables selected;
- change formatting options, such as number of decimal places to display, for all reports (these may also be changed in individual reports, but format options can overwrite previous edits);
- change statistics options, such as average scale scores and achievement levels, for all reports (these may also be changed in individual reports, but statistics options can overwrite previous edits);
- select reports to be built into tables and charts at step 4, **Build Reports**; and
- delete reports.

Using your chosen criteria, the IDE will return a separate data report for each variable you have chosen. If you have selected two or three variables (not counting **All Students**), you will also see

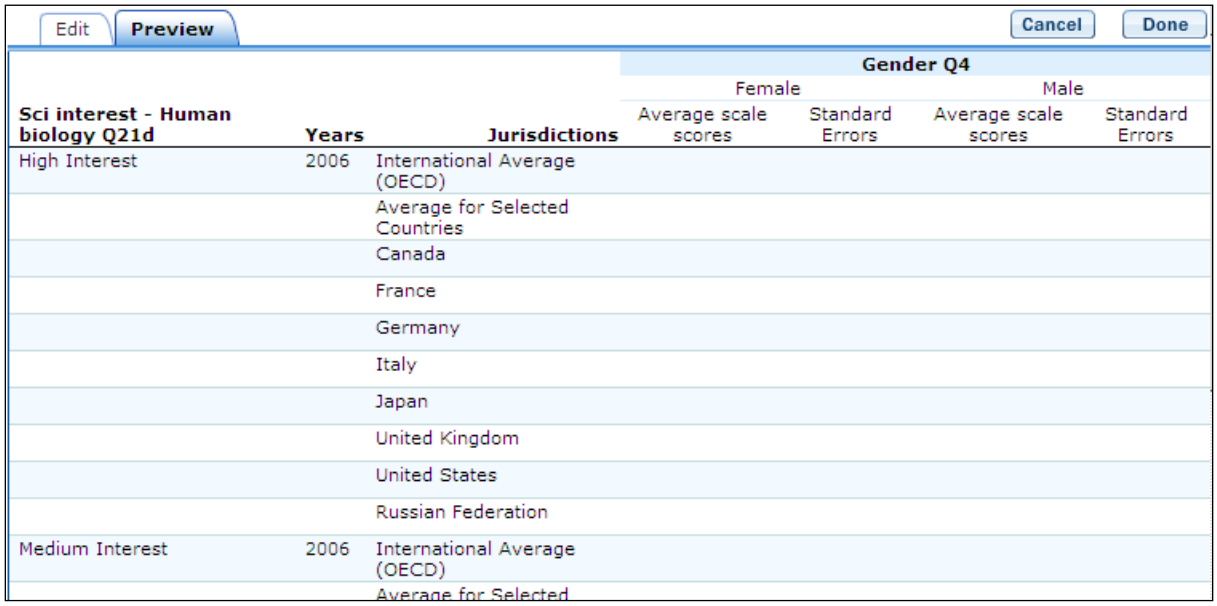
a cross-tabulated report that crosses these two or three variables. If your selected criteria include more than one measure (e.g., combined science scale and one or more science subscales), a separate set of data reports will be generated for each measure (see exhibit 8).

Exhibit 8. Edit reports overview

B. Preview Report

Select **Preview** to see how your report will be laid out. The preview will not provide actual data, but will show how the data will be arranged in rows and columns (see exhibit 9).

Exhibit 9. Edit reports using preview report



Edit | Preview | Cancel | Done

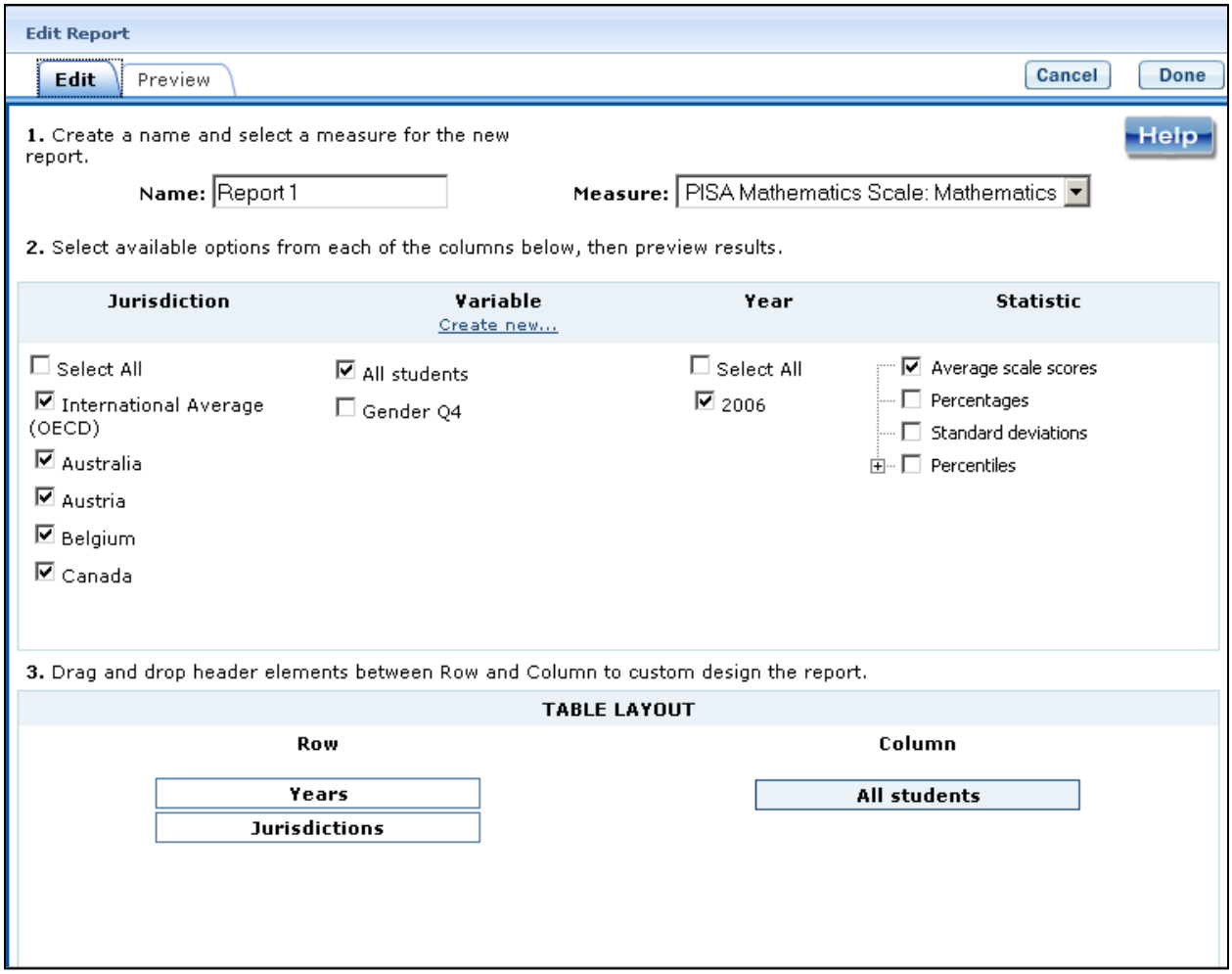
Sci interest - Human biology Q21d	Years	Jurisdictions	Gender Q4			
			Female		Male	
			Average scale scores	Standard Errors	Average scale scores	Standard Errors
High Interest	2006	International Average (OECD)				
		Average for Selected Countries				
		Canada				
		France				
		Germany				
		Italy				
		Japan				
		United Kingdom				
		United States				
		Russian Federation				
Medium Interest	2006	International Average (OECD)				
		Average for Selected				

C. Edit Report

You can edit your report by choosing **Edit** under **Action** on the **Edit Reports** main screen. (You can select **Preview** at any time to see how your changes will affect the report's final layout.) Another way to edit a report is to select the **Edit** tab when you are previewing a report. The following can be done using this function (see exhibit 10):

1. Name your report. You have the option to give each report a distinctive name, up to a limit of 50 characters using only letters, numbers, spaces, underscores, and hyphens. (Otherwise, the default is Report 1, Report 2, etc., and Cross-Tabulated Report 1, Cross-Tabulated Report 2, etc.)
2. Select a measure. You can choose a measure if more than one was selected at step 1.
3. Select jurisdictions, variables, years (if applicable), and statistics to include (out of the selections previously made at steps 1 and 2). You can also create new variables out of the ones already chosen (For further information, see section D. Edit Reports: Create New Variables.) You can select up to two statistics options from the following: average scale scores; percentages; achievement levels–discrete; percentiles; and standard deviations. (For further information, see section G. Edit Reports: Statistics Options.)

Exhibit 10. Editing reports



4. Change the table layout by dragging elements to determine which items will appear in rows and which will appear in columns. Some of the arrangements will not be permissible, but a pop-up alert will explain this.

Be advised that to save changes, make sure to select **Done** in the lower right portion of the screen before closing the **Edit Report** window.

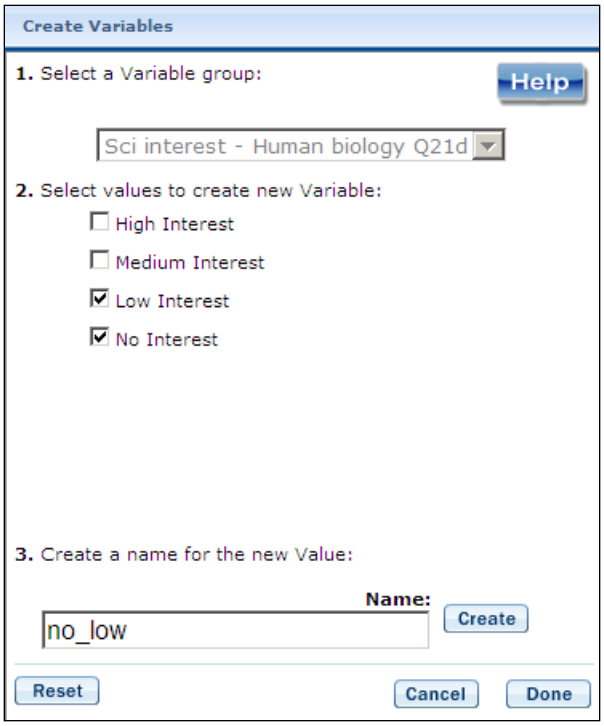
D. Create New Variables

This tab can be reached only from within the **Edit Report** window or **Create New Report** window. To create a new variable, you can combine values that make up an existing variable. The steps are as follows:

1. Click **Create new...** under the **Variable** heading in the **Edit Report** window or **Create New Report** window.

2. Select the variable for which you wish to combine values.
3. Select the values you want to combine by checking the boxes to the left of the values (see exhibit 11).
4. Create a name for the new value, and press **Create**. See how the collapsed values appear in gray.
5. Wait for the screen to refresh, and press **Done**.

Exhibit 11. Creating new variables



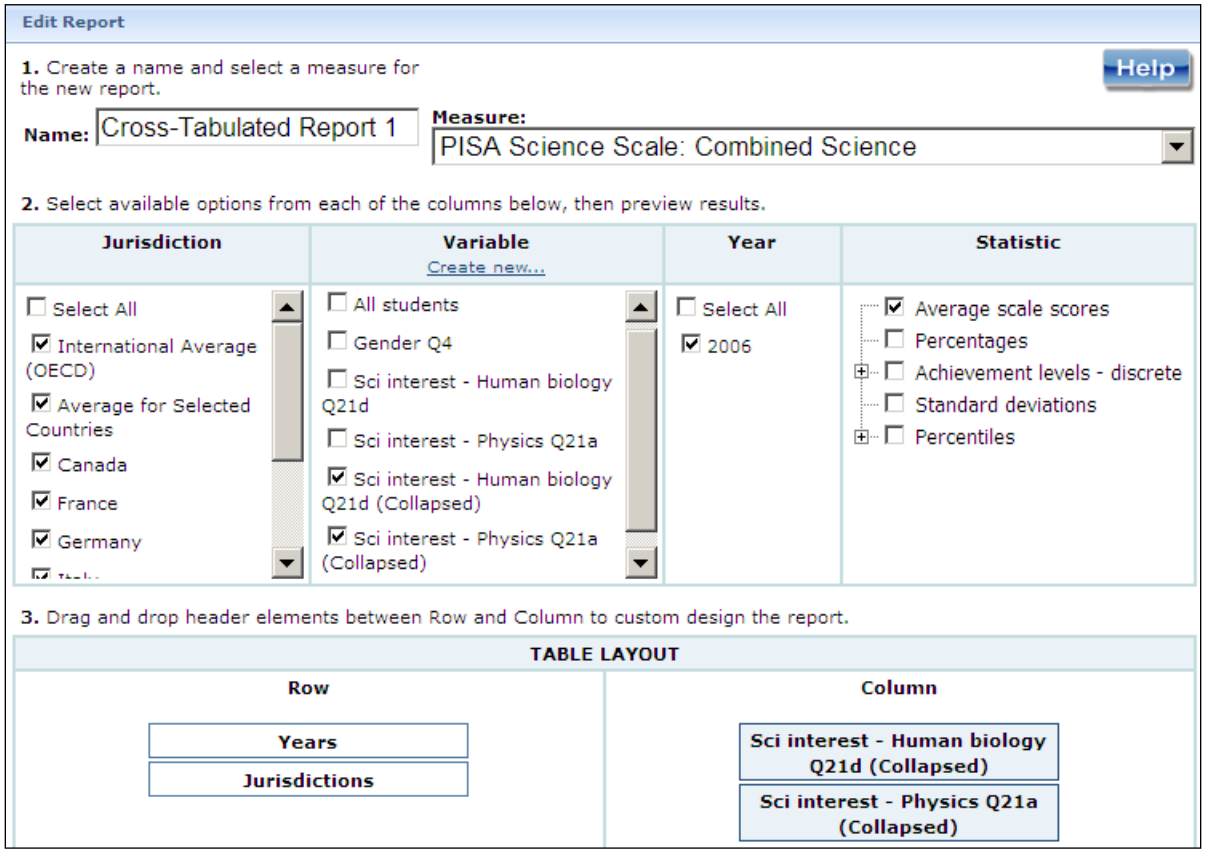
6. The new variable will appear in the **Variable** list in the **Edit Report** window or **Create New Report** window, with the new variable name designated as "(Collapsed)". You will need to check the box next to the new (collapsed) variable for it to appear in the report. You can click **Preview** to see how the table will be laid out before retrieving data.

A new variable that you create is applicable to that specific report; it does not apply to the other reports appearing in the **Edit Reports** screen. For example, if you selected multiple measures of science literacy for analysis, then you would need to create the new variable for each measure, or create a copy of the report and edit it accordingly. To do the latter, click on **Copy** report in the **Edit Reports** screen (copied reports appear at the end of the list of reports) and then edit the new copy (using the above example, you can change the measure and give the report a new name).

You can repeat the process and combine different values of a variable to create additional new variables. Using the **Create New Report** function, you can create a new report for each new variable that you create. (For further information, see section E. Edit Reports: Create New Report.)

If you selected two or three variables to create new variables from, you can repeat the process for each of these variables. Using the **Create New Report** or **Edit Report** function, these collapsed variables will be listed and available for cross-tabulation (see exhibit 12). You can click **Preview** to see how the table will be laid out before retrieving data.

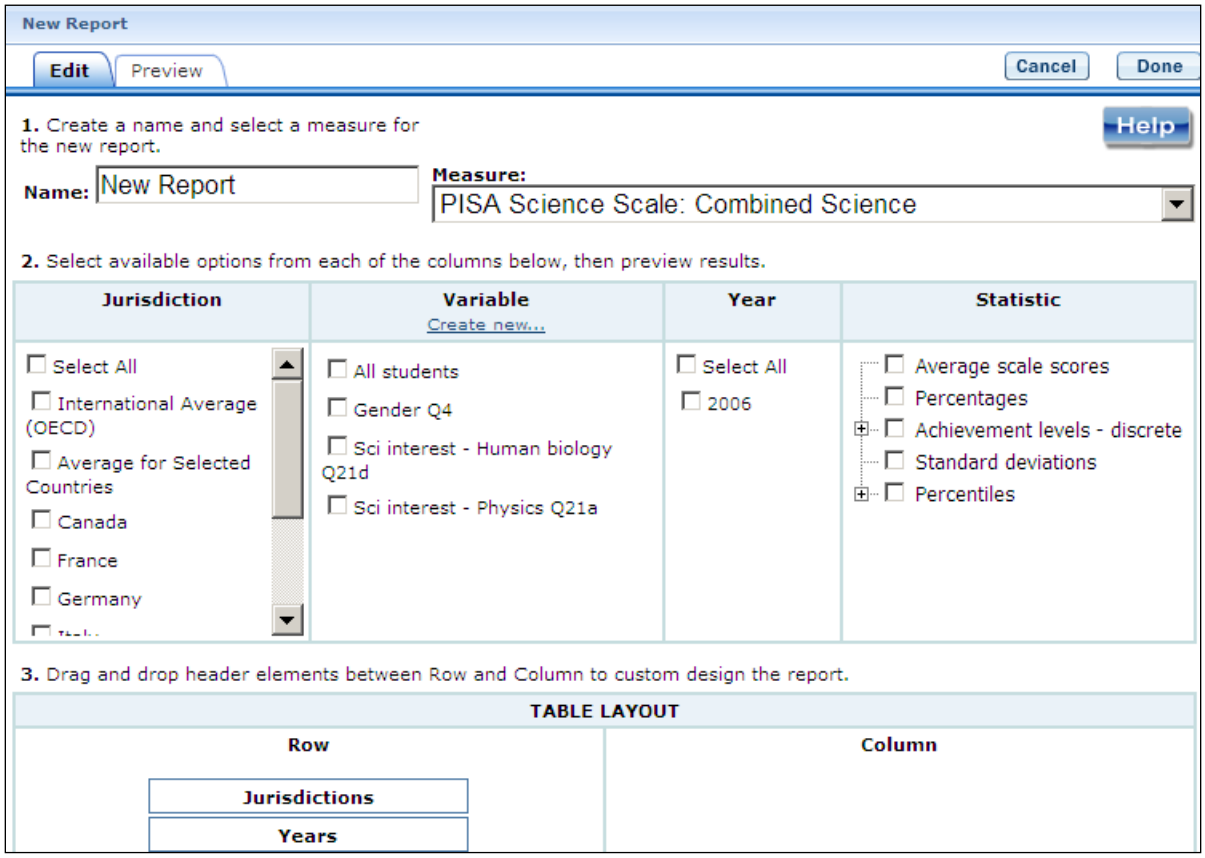
Exhibit 12. Edit reports with collapsed variables



E. Create New Report

From the main **Edit Reports** screen, clicking on **Create New Report** brings up the same options as **Edit**, but with no checkboxes marked and without any new variables you may have created. Thus, **Create New Report** provides a "clean slate" for your selections from the first two steps, **Select Criteria** and **Select Variables** (see exhibit 13). Each new report you create will appear at the end of the list of reports. If you do not give the report a specific name, it will be called “New Report.”

Exhibit 13. Creating new reports



F. Format Options

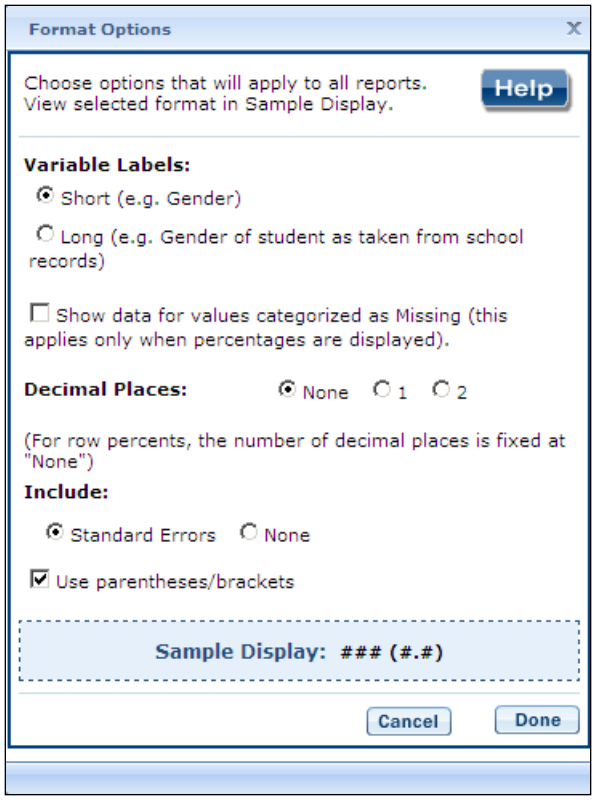
From the main **Edit Reports** screen, clicking on **Format Options** will allow you to make formatting changes applicable to all the reports listed. The following formatting options are available using this function (see exhibit 14):

1. **Variable Labels (Long)** displays a more detailed description of the variables selected in a query than the default short label. For variables from questionnaires, the full text of the question is displayed. Be advised that the length of the extra detail may sometimes interfere with table formatting.
2. **Show data for values categorized as Missing** will include the percentage of students in the total sample or in a reporting group for whom membership in a particular response category is unknown because no response was given by the student, their teacher, or their school. The percentage of "missing" will be shown in the right-most table column. Missing data are available only for queries that involve percentages as the statistic type. Unless you check this option, the default is for missing responses not to be included in the percentage distribution shown.
3. **Decimal Places** allows you to specify a greater level of precision for a particular statistic (one or two decimal places) as opposed to the default, which is whole numbers. Note that

only integer-level precision is allowed for percentages; that is, the number of decimal places is fixed at **None** for percentages. Also, standard errors will be shown to one more decimal place than what is shown for a particular statistic. For example, if you request that the achievement scores be displayed to one decimal place, the corresponding standard errors will be displayed to two decimal places. If you export to Excel, you will be able to increase the number of decimal places in most cases.

4. **Include** gives you the options to show or not show standard errors and parentheses/brackets surrounding the standard errors. Unless you indicate otherwise, the default is to show standard errors with parentheses surrounding the standard errors. You can preview the effects of your selection in the **Sample Display** area (see blue-shaded box).

Exhibit 14. Format options



Be advised that choices in the **Format Options** window will apply to all reports and cannot be changed for individual reports. Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to restore the **Format Options** to the default settings (though a word of caution, as this will also delete any new reports that you created).

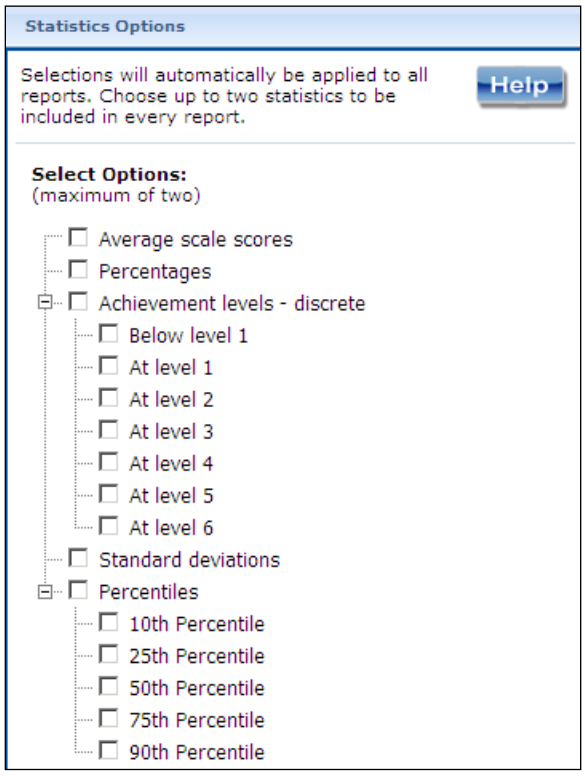
G. Statistics Options

Available only from the main **Edit Reports** screen, clicking on **Statistics Options** allows you to designate up to two statistics. The selections made are applicable to all the reports listed, although you can also change the statistics for an individual report when you edit that report. (For further information, see section C. Edit Reports: Edit Report.)

The following statistics options are available (see exhibit 15):

1. **Average scale scores.** For the PISA assessment, student performance is reported on scales that range from 0 to 1,000. PISA reports the average scale score for a variety of demographic samples of the student population (e.g., the average scale score in science for female students). By default, the standard errors of the scale scores are shown in parentheses.
2. **Percentages.** This statistic shows the percentage of students as a row percentage. For example, if the table cell for Black female students in the United States is 7 percent, then Black females composed 7 percent of the total number of students assessed. By default, percentage distributions do not include those with missing data. For information on how to show data for values categorized as missing, see section F. Edit Reports: Format Options.

Exhibit 15. Statistics options



3. **Achievement levels – discrete.** Discrete achievement levels are reported as the percentage of students performing at each PISA proficiency level, counted separately from the other proficiency levels:
    - *Below level 1*
    - *At level 1*
    - *At level 2*
    - *At level 3*
    - *At level 4*
    - *At level 5*
    - *At level 6*
4. **Percentiles.** This statistic shows the threshold (or cutpoint) score for the following:
    - *10th percentile – the bottom 10 percent of students*
    - *25th percentile – the bottom quarter of students*
    - *50th percentile – the median (half the students scored below the cutpoint and half scored above it)*
    - *75th percentile – the top quarter of students*
    - *90th percentile – the top 10 percent of students*
5. **Standard deviations.** The standard deviation is a measure of how widely or narrowly dispersed scores are for a particular data set. Under general normality assumptions, 95 percent of the scores are within two standard deviations of the mean. For example, if the average score of a data set is 500 and the standard deviation is 100, it means that 95 percent of the scores in this data set fall between 300 and 700. The standard deviation is the square root of the variance.

The selections you make in **Statistics Options** will be applied automatically to all reports, although you can change the statistics for an individual report when you edit that report. Be advised that if you use **Statistics Options** after editing the statistics in one or more of your individual reports, the options selected will overwrite your previously edited selections. If you wish to use the same criteria and variables in a report with a different selection of statistics, consider using the **Create New Report** function to generate a new report with different statistics. (For further information, see section E. Edit Reports: Create New Report.) You can also make a copy of an individual report.

You can use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to restore the **Statistics Options** to the default setting, which is average scale scores for all reports (this will also delete any new reports that you created).

Not all statistics are available for all reports. Availability depends on other selections you have made to define the content and format of your report:

- Percentages will not display if jurisdictions or years appear in columns.
- Achievement level results cannot be displayed in both columns and rows.
- Achievement level results are available only for the combined scale of the subject that is the major domain (e.g., combined science scale for PISA 2006).
- If achievement levels are selected as a variable, only percentages will be displayed.

Please note that statistics produced by the IDE may not match the statistics shown in reports published by OECD due to differences in certain statistical standards. In particular, organizations differ in the minimum sample sizes required for publishing student scores.

H. Select Reports to Build

As you edit your reports, you can give them distinct names (up to 50 characters) to differentiate them, as well as make changes to the jurisdictions and variables previously selected, the statistics, and the layout of the rows and columns. (For further information, see section C. Edit Reports: Edit Report.) You may also have made copies of reports with these changes. In order to proceed to step 4, **Build Reports**, each report for which you want to retrieve data should be previewed/inspected using the Preview function. To decrease processing time as you move to step 4, you can uncheck any reports for which you do not wish to retrieve data. By default, all reports are checked. To uncheck one or more reports, you can either uncheck the reports individually or click on the **All** box. Doing the latter will uncheck all of the reports and allow you to check only those that you wish to retrieve data for. In the example that follows (see exhibit 16), data will be retrieved only for the combined science measure and only for the highest education level of parents report. For this report, the statistics have been edited to show both average scale scores and percentages.

Exhibit 16. Selecting reports to build

Subject, Grade: Science, Age 15
Jurisdictions: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
Measures: PISA Science Scale: Combined Science, PISA Science Subscale: Identifying Scientific Issues
Variables: Gender Q4, Highest educational level of parents (ISCED), Immigration status, Public or private Q2
Year: 2006

Reset

Create New Report | Format Options | Statistics Options

Report	All	Action	Measure	Variable	Year	Jurisdiction	Statistic
Report 1	☐	Preview | Edit Delete | Copy	PISA Science Scale: Combined Science	Gender Q4	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 2	☑	Preview | Edit Delete | Copy	PISA Science Scale: Combined Science	Highest educational level of parents (ISCED)	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 3	☐	Preview | Edit Delete | Copy	PISA Science Scale: Combined Science	Immigration status	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 4	☐	Preview | Edit Delete | Copy	PISA Science Scale: Combined Science	Public or private Q2	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 5	☐	Preview | Edit Delete | Copy	PISA Science Subscale: Identifying Scientific Issues	Gender Q4	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 6	☐	Preview | Edit Delete | Copy	PISA Science Subscale: Identifying Scientific Issues	Highest educational level of parents (ISCED)	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 7	☐	Preview | Edit Delete | Copy	PISA Science Subscale: Identifying Scientific Issues	Immigration status	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages
Report 8	☐	Preview | Edit Delete | Copy	PISA Science Subscale: Identifying Scientific Issues	Public or private Q2	2006	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Ko...	Average scale scores, Percentages

If you wish to delete a report from the list of reports, click **Delete** in the **Action** column. Use the **Reset** button located in the upper right portion of the screen (just below the **Help** button) to restore the deleted reports (though a word of caution, as this will also delete any new reports that you created and restore the **Format Options** and **Statistics Options** to the default settings).

To continue to the last step in the IDE, click the **Build Reports** button at the bottom of the page or the tab at the top of the page to go to the next screen.

4. Build Reports

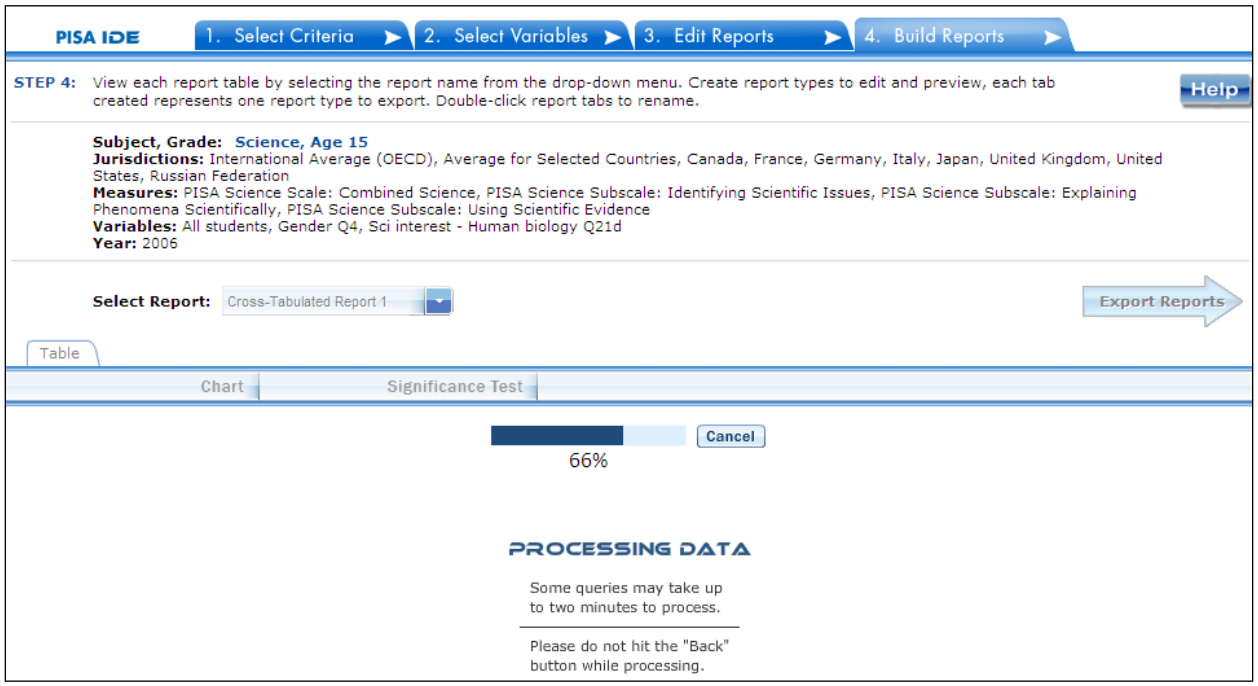
A. Overview

You can access step 4, **Build Reports**, after choosing criteria at step 1, **Select Criteria**, in which case the default report built will provide data for just average scale scores and for the **All Students** variable. In most cases, you will proceed to step 4, **Build Reports**, not only after completing step 1, but also after choosing different or additional variables at step 2, **Select Variables**, and editing the reports at step 3, **Edit Reports**.

In **Build Reports**, you can do the following:

1. Generate a data table for each report selected in step 3, **Edit Reports** (see exhibit 17). By default, all reports are checked, though you can uncheck any reports for which you do not wish to retrieve data. (For further information, see section 3-H. Edit Reports: Select Reports to Build.)
2. Export and save data tables into various formats using the **Export Reports** button. The output formats include HTML (print-friendly), Microsoft Word, Microsoft Excel, and Adobe PDF.
3. Select the **Chart** tab to create and customize charts of the data for each report and save them for export in the above formats.
4. Select the **Significance Test** tab to run a significance test on your results, customize it and export it.

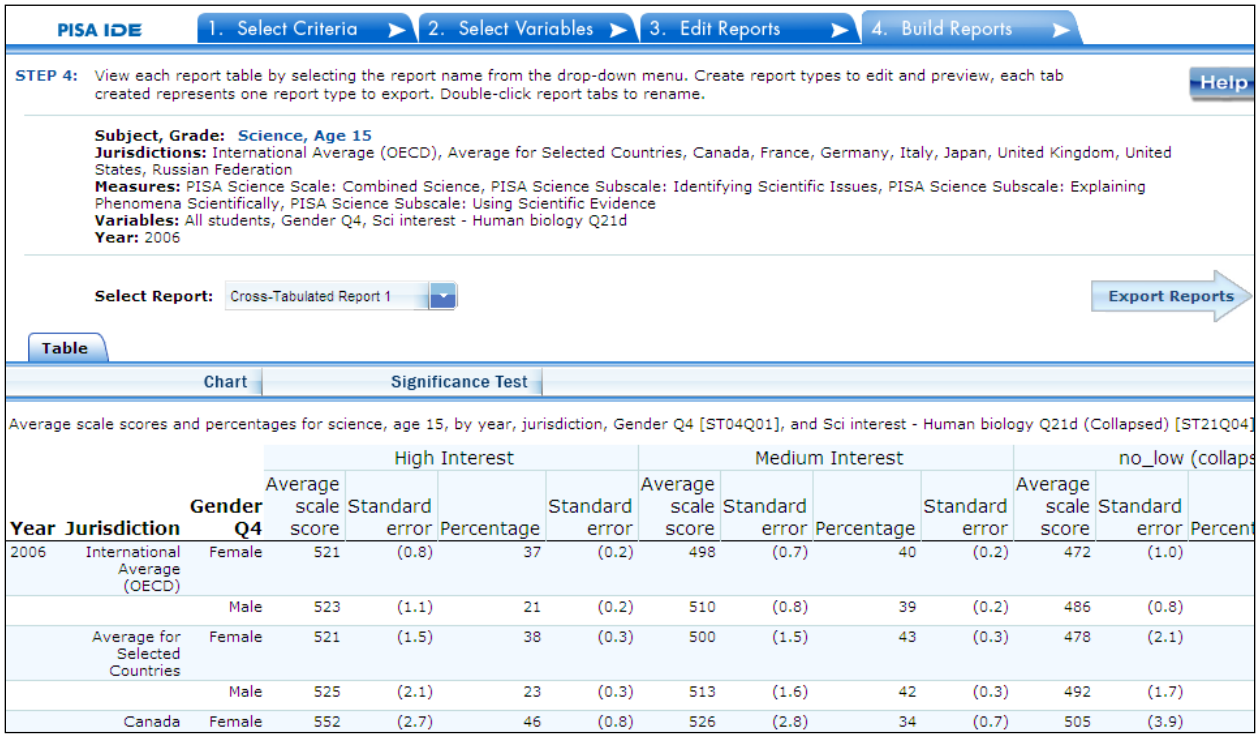
Exhibit 17. Building reports overview



B. View Reports as Data Tables

Once the IDE processes the data for the reports you selected to be built, you will be able to see the data table for the first report (see exhibit 18). Go to **Select Report** to choose the table of interest from the drop-down menu. To change the formatting or statistics options of a table or to generate a table from a report not included in your selection, return to step 3, **Edit Reports**.

Exhibit 18. Viewing reports as data tables

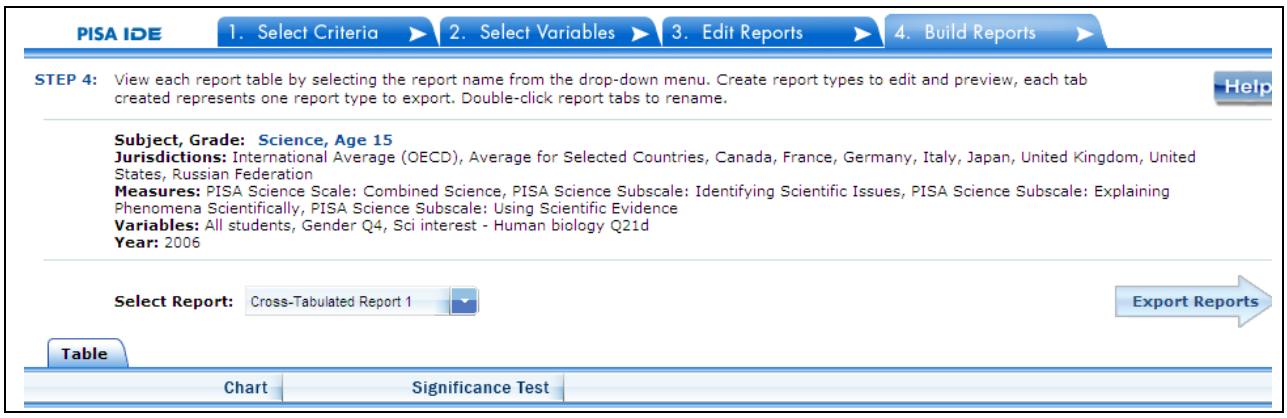


			High Interest				Medium Interest				no_low (collaps		
Year	Jurisdiction	Gender Q4	Average scale score	Standard error	Percentage	Standard error	Average scale score	Standard error	Percentage	Standard error	Average scale score	Standard error	Percent
2006	International Average (OECD)	Female	521	(0.8)	37	(0.2)	498	(0.7)	40	(0.2)	472	(1.0)	
		Male	523	(1.1)	21	(0.2)	510	(0.8)	39	(0.2)	486	(0.8)	
	Average for Selected Countries	Female	521	(1.5)	38	(0.3)	500	(1.5)	43	(0.3)	478	(2.1)	
		Male	525	(2.1)	23	(0.3)	513	(1.6)	42	(0.3)	492	(1.7)	
	Canada	Female	552	(2.7)	46	(0.8)	526	(2.8)	34	(0.7)	505	(3.9)	

C. Charts

Go to **Select Report** to choose the report of interest from the drop-down menu, and then click the **Chart** link (see exhibit 19).

Exhibit 19. Viewing reports as charts



You will be able to create many types of charts, and customize them. Exhibit 20 provides a summary of the custom features, and they are further explained in section E. Create Charts – Chart Options.

Exhibit 20. Chart options

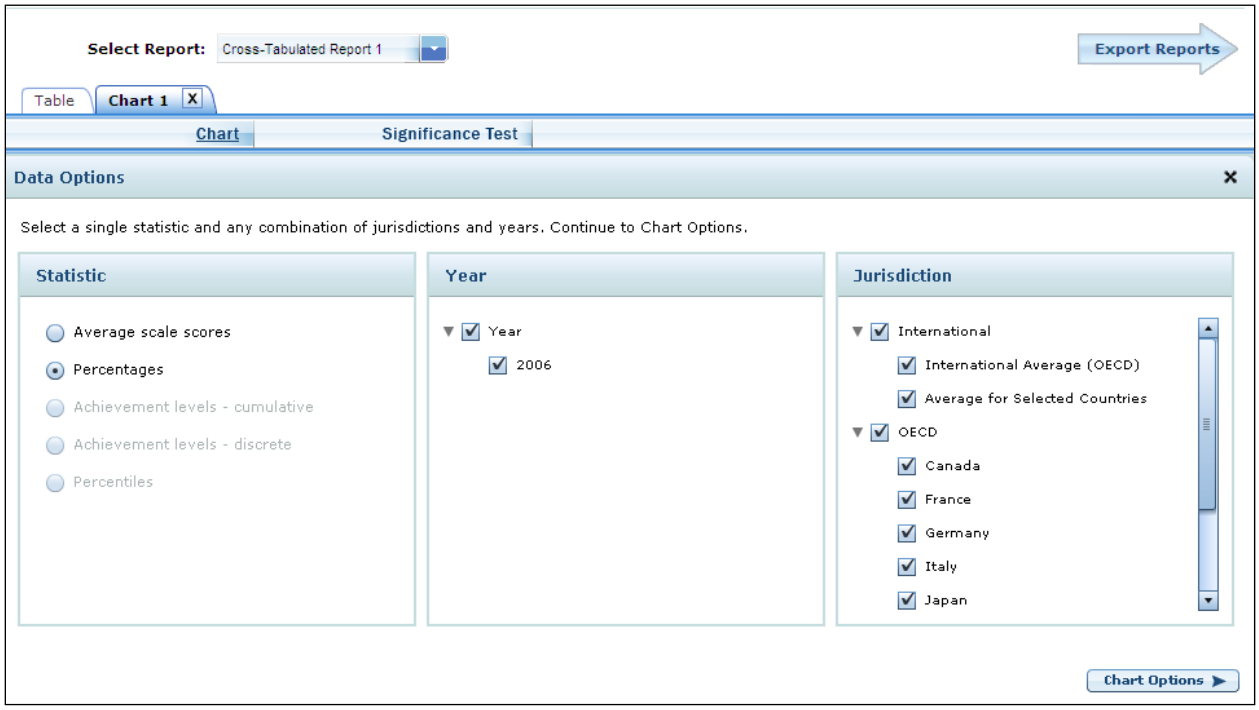
Actions	Description
Chart Options	Select display type (bars, columns, or lines) with your cursor. Customize the chart and preview it.
Preview	Change the jurisdiction and other variables as applicable. Also change the pattern and color in your chart.
Color	Change the color of the chart by clicking on one of each type bar so that a small square appears. Click on the small square, and a custom color grid will appear; click on the color of choice.
Pattern	Click the bars to change the pattern.
Grayscale	Available for the discrete (achievement levels) chart; it will format the chart or map to print in black and white.
Click here to edit this chart	Edits will overwrite your previous version once you press **Done**. If you wish to produce a different chart based on the same report, begin by clicking **Chart** again.
Export Reports	After pressing **Done** for the last report, press the **Export Reports** button.

If you complete one chart and wish to try a different type of chart, you will need to **Preview** the chart and press **Done** in order to save the chart to export.

D. Create Charts – Data Options

When you click **Chart,** your screen will present **Data Options** pertaining to **Statistic, Year,** and **Jurisdiction.** All are selected by default, except that you can have only one statistic (see exhibit 20). Uncheck any of the criteria that you do not wish to chart, as long as you have one selected in each category.

Exhibit 21. Data options for charts



E. Create Charts – Chart Options

Once finished with the **Data Options**, click the **Chart Options** button in the lower right corner.

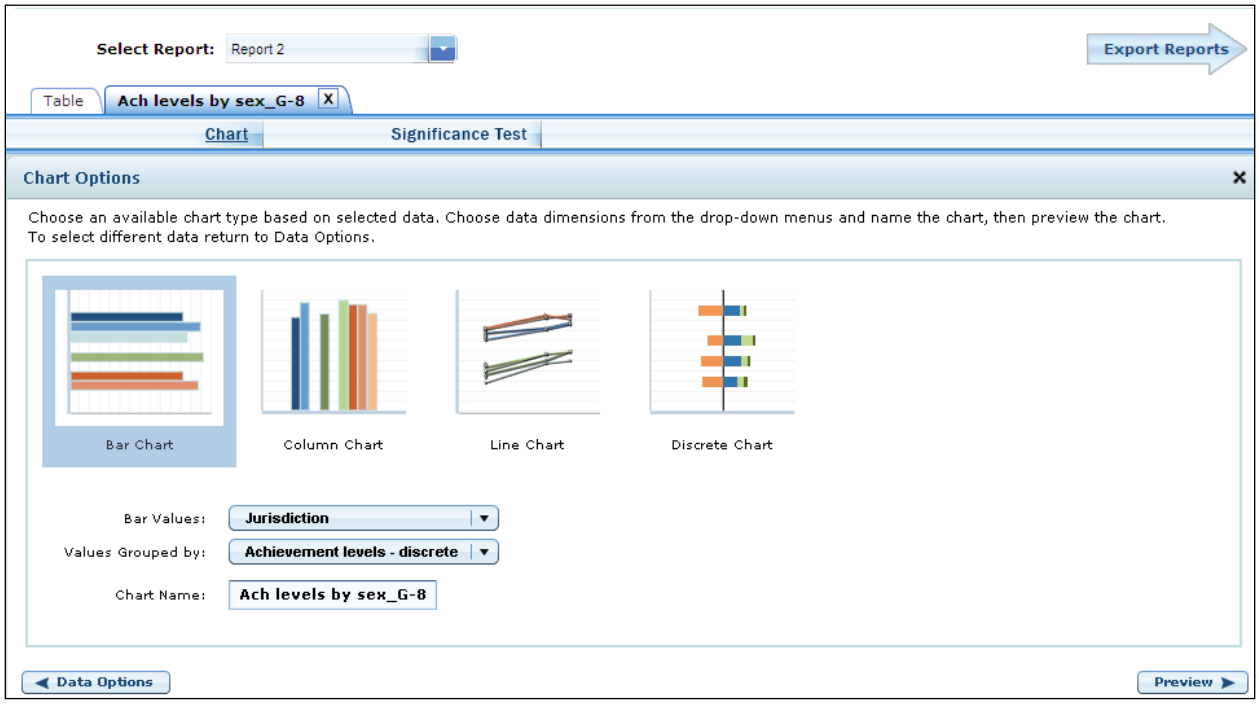
In the **Chart Options** screen, select **Bar Chart, Column Chart,** or **Line Chart.** For data on achievement levels, you also have the option of selecting a **Discrete Chart**.

After selecting a chart type, change any data dimensions from the drop-down menus for **Bar, Column,** or **Line Values** and **Values Grouped by.** Any new variables that you created at step 3, **Edit Reports**, will be available for selection, but only if you selected the variables (i.e., check mark next to them) and pressed **Done** when you edited the report.

Enter a **Chart Name** limited to 25 characters, using only letters, numbers, spaces, underscores, and hyphens (otherwise, the default is “Chart 1”) (see exhibit 21).

Preview your chart by clicking the **Preview** button in the lower right corner, or go back to the data options and make different selections by clicking the **Data Options** button in the lower left corner.

Exhibit 22. Chart options



While previewing your chart, you can do the following (see exhibit 23 as an example of a **Discrete Chart** and exhibit 24 as an example of a **Bar Chart**):

1. Use the drop-down menus to change the jurisdiction and other variables as applicable. Notice that when you change your selection, the change occurs slowly enough that you get a sense of the size and direction of the change—especially if you didn't previously specify in the data dimensions how you want your values grouped by.
2. For the **Discrete Chart,** you can select where you want the divider by clicking one of the achievement level buttons above the bars. This makes it much easier to compare the percentages at a given level(s). In the example shown in exhibit 22, the percentages of students at PISA proficiency levels 5 and 6 are shown to the right of the divider.
3. Place your cursor over the bars of the chart to see the data points and value label(s).
4. Choose between using colors or patterns for the bars by clicking the alternating **Pattern** or **Color** button located just below the **Chart** tab in the upper left portion of the screen. For the **Discrete Chart,** choose between **Color** or **Grayscale.**

Exhibit 23. Preview of discrete chart

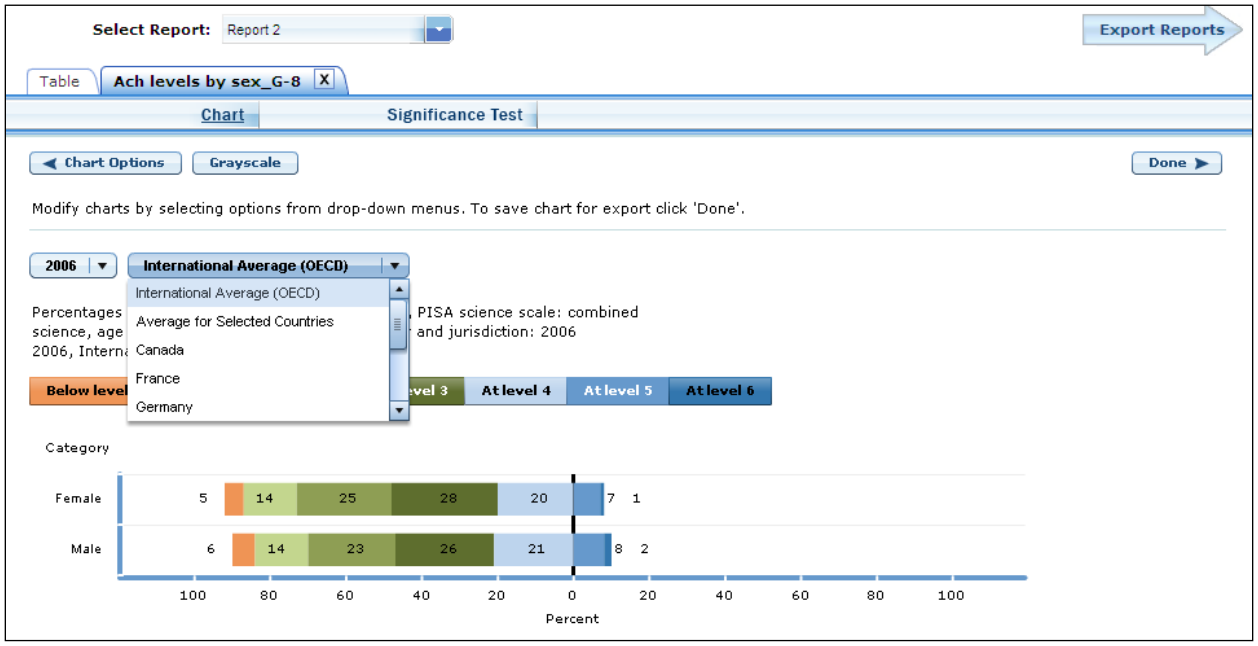
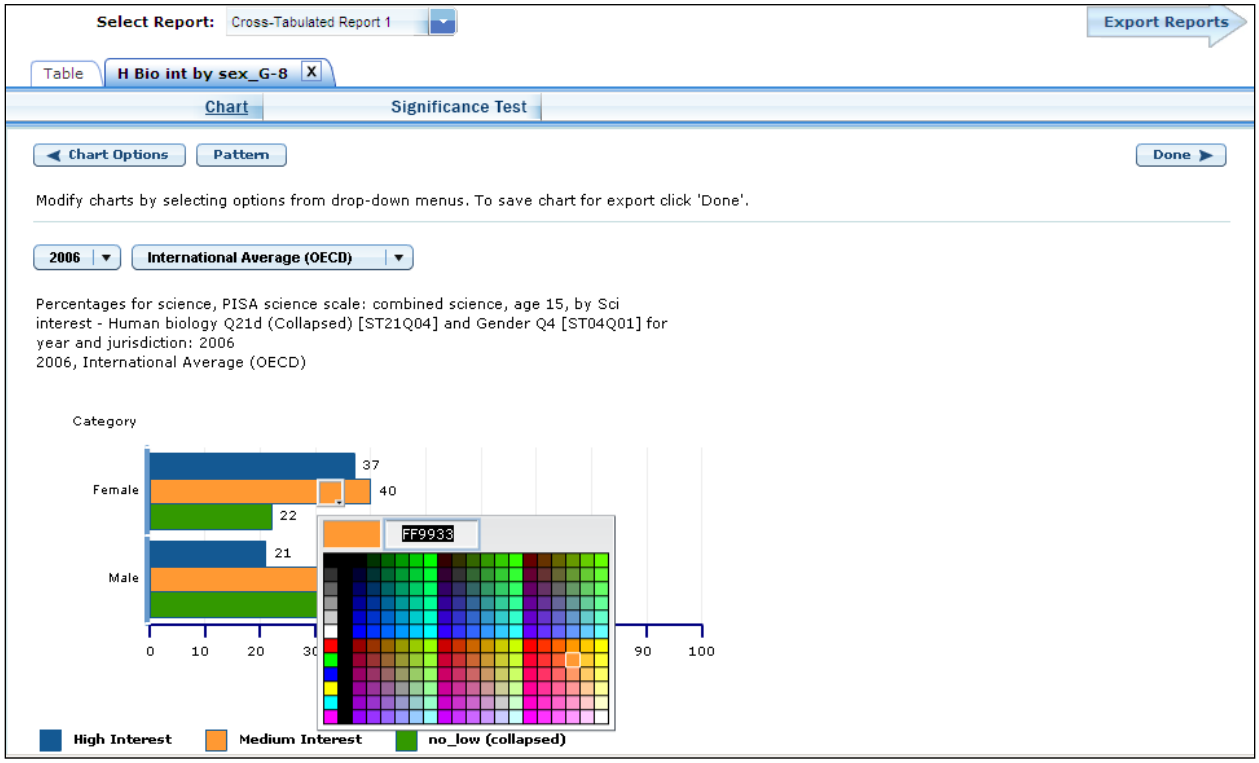


Exhibit 24. Preview of bar chart



5. Change the color of the bars with a single click on each level in the bars. That click brings a thumbnail of a color chart. Click on the thumbnail to reveal a color grid, and then select the color you desire.
6. Change the pattern of the bars with a single click on each level in the bars. Continuous clicking brings up many patterns to choose from.

Click the **Done** button located on the right side of the screen, or click back to **Chart Options** and/or **Data Options** to change your selection criteria. You must click **Done** if you wish to later save and/or print your chart via the Export Wizard.

Done takes you to the exportable version of the chart, but you can subsequently **"Click here to edit this chart"** (located in the upper left corner, below the **Chart** link) to make more changes. Alternatively, the entire chart area, if clicked, will take you to the edit screen.

To make an additional chart from the same report/table, click the **Chart** link to begin a new chart. It is recommended that you provide a new chart name (the default is Chart 1, Chart 2, etc.). If you don't start the chart process again by clicking the **Chart** link, the new chart will overwrite the previous one.

If you wish to make charts using other reports or additional ones, select another report in the **Select Report** drop-down list. If other reports were not checked in step 3, **Edit Reports**, go back to step 3 and check the ones you want. When you then advance to step 4, Build Reports, the reports will appear in the **Select Report** drop-down list. If you need to create new reports, go back to step 1, **Select Criteria**, and/or step 2, **Select Variables**. Remember to export any completed charts you want to save by clicking **Done** and using the **Export Reports** function before leaving the **Build Reports** screen. (For further information, see section G. Build Reports: Export Reports.)

F. Significance Tests

Tests for statistical significance indicate whether observed differences between assessment results are likely to have occurred because of sampling error or chance. "Significance" here does not imply any judgment about absolute magnitude or educational relevance. It refers only to the statistical nature of the difference and whether that difference likely reflects a true difference in the population.

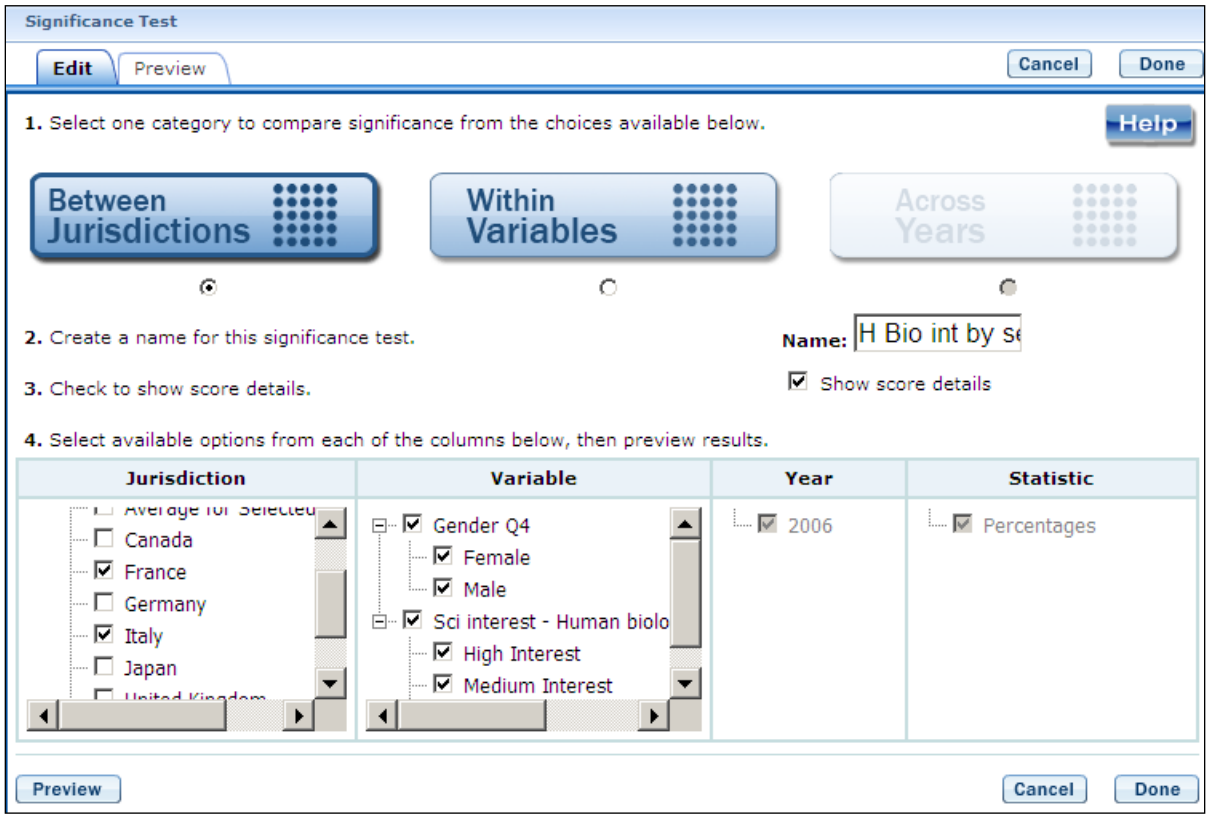
With your report of interest selected, click the **Significance Test** link, which is located towards the middle of the screen, to the right of the **Chart** link. You first need to decide which variable you want to test and the criterion by which you want to test that variable (i.e. within or between variable values). You will compare or "look across" the criterion's range of values, so it must have more than one value. You can look across jurisdictions for a variable, that is, compare between two or more jurisdictions, or you can look across the values within a variable for a single jurisdiction. For example, with the variables shown in exhibit 25 you can choose to compare female scores between countries, or you could choose to compare male and female

scores within a country. Once the primary criterion is chosen, all other criteria must be restricted to a single value.

The general steps for running significance tests are as follows (see exhibit 24):

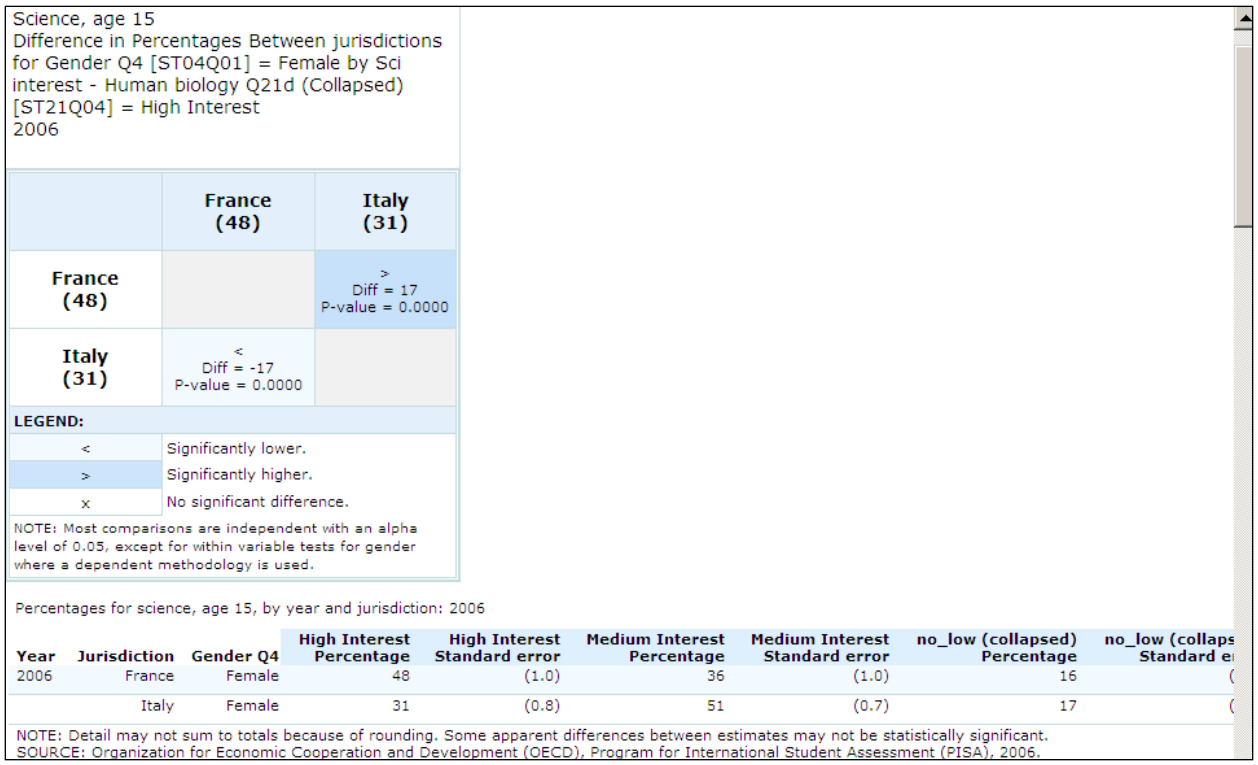
1. In the **Significance Test** window select either **Between Jurisdictions** or **Within Variables.** Select **Jurisdiction(s), Variable(s),** and **Statistic(s).** For the **Between Jurisdictions** option, you must select at least two jurisdictions. For **Within Variables**, you can select one or more jurisdictions.
2. Enter a **Name** limited to 25 characters, using only letters, numbers, spaces, underscores, and hyphens (otherwise, the default is "Sig Test 1").
3. Located under the test **Name**, you can check **Show Score Details** to display the estimates and standard errors for the table cells.
4. Click the **Preview** tab located in the upper left corner, or the **Preview** button located in the bottom left corner.
5. Click the **Edit** tab in the upper left corner of the screen if you wish to go back and make changes to the selections you made for running the significance tests.
6. Click the **Done** button in the upper or lower right corner of the screen to run the significance tests.

Exhibit 25. Significance tests options



In the significance test matrix, you will see the differences and *p*-values. As shown in the legend of the matrix, it is indicated whether one estimate is significantly lower or higher than another estimate, or if there is no significant difference between them (see exhibit 25). Most comparisons are independent with an alpha level of 0.05, except for within-variable tests for gender where a dependent methodology is used. Please note that multiple comparisons are not available in the IDE.

Exhibit 26. Significance test output



Science, age 15
Difference in Percentages Between jurisdictions for Gender Q4 [ST04Q01] = Female by Sci interest - Human biology Q21d (Collapsed) [ST21Q04] = High Interest
2006

	France (48)	Italy (31)
France (48)		> Diff = 17 P-value = 0.0000
Italy (31)	< Diff = -17 P-value = 0.0000	

LEGEND:	
<	Significantly lower.
>	Significantly higher.
x	No significant difference.

NOTE: Most comparisons are independent with an alpha level of 0.05, except for within variable tests for gender where a dependent methodology is used.

Percentages for science, age 15, by year and jurisdiction: 2006

Year	Jurisdiction	Gender Q4	High Interest Percentage	High Interest Standard error	Medium Interest Percentage	Medium Interest Standard error	no_low (collapsed) Percentage	no_low (collaps Standard e
2006	France	Female	48	(1.0)	36	(1.0)	16	(
	Italy	Female	31	(0.8)	51	(0.7)	17	(

NOTE: Detail may not sum to totals because of rounding. Some apparent differences between estimates may not be statistically significant.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2006.

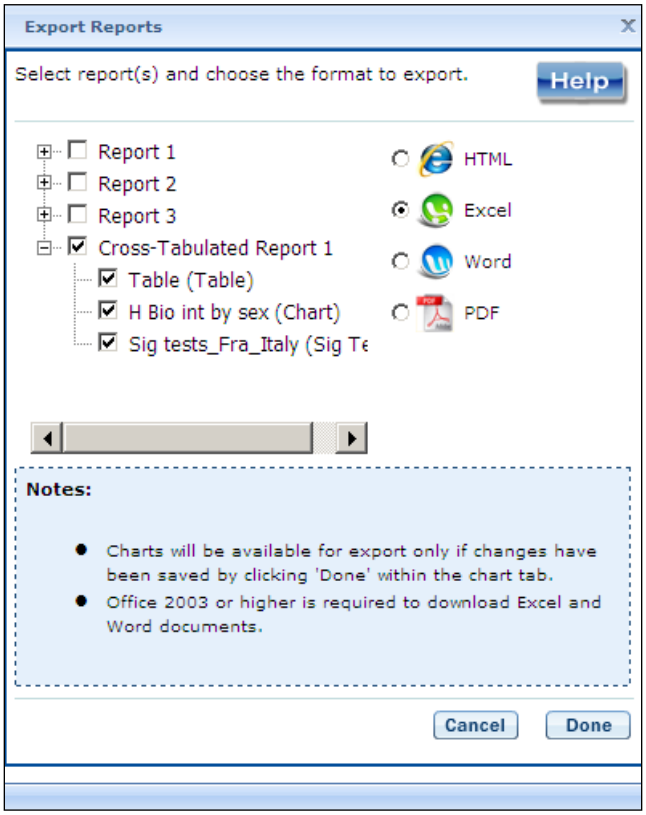
G. Export Reports

Click on the **Export Reports** button/arrow located on the right side of the screen to save or print your tables, charts, and significance tests. The report names that appear in the **Export Reports** window are those that were checked off at step 3, **Edit Reports**.

Check the files you want to export, and select one of the file formats: **HTML** (print-friendly), **Excel, Word,** and **PDF** (see exhibit 26). All reports that you select at the same time will be exported in one file. In the Excel format, you will be able to increase the decimal places visible (wherever more precision is available in the database). Because there are many different operating systems in use, you may get an error message with Excel or one of the other formats. Usually, this will not affect your ability to export, so please wait for software "errors" to resolve themselves.

Charts for each report will only be available on this menu if you saved them by clicking **Done** on the last screen when you created them. If a chart that you wish to save or print is grayed out (not available for selection), cancel the **Export Reports** tool, go back to your chart, and be sure to click **Done** on the last screen. After that, it will be available for export.

Exhibit 27. Export report options



If you edited report tables or completed charts that you wish to save or print, remember to do this via the **Export Reports** function before leaving the **Build Reports** screen. Returning to prior screens to edit the report table formats or change variables or criteria will overwrite the report tables and charts.

V. PISA IDE Definitions

This section describes the kinds of criteria and variables that are used to form data queries, as well as the kinds of data available and statistical methods to assess them.

These topics include the following:

- Criteria
  - Subject
  - Measures
  - Jurisdictions
- Variables
- Statistics Options
  - Average scale scores
  - Percentages
  - Achievement levels (discrete)
  - Percentiles
  - Standard deviations
- Cross-tabulations
- Statistical Notations and Other Notes

1. Criteria

Each data query must include at least one selection from three criteria choices: subject, measure and jurisdiction. Shown below is an outline of these selection criteria followed by a brief description.

1. Subject:
   - Science Literacy
   - Reading Literacy
   - Mathematics Literacy
2. Measure:
   - PISA Science Scale: Combined Science
   - PISA Science Subscale: Identifying Scientific Issues
   - PISA Science Subscale: Explaining Phenomena Scientifically
   - PISA Science Subscale: Using Scientific Evidence
   - PISA Attitude Scale: Interest in Science
   - PISA Attitude Scale: Support for Scientific Inquiry
   - PISA Reading Scale: Reading
   - PISA Mathematics Scale: Mathematics
3. Jurisdiction:
   - International Average
   - Average for Selected Countries
   - OECD

- Non-OECD

Subject

PISA assesses reading literacy, mathematics literacy, and science literacy at each administration; thus, any can be selected as the subject.

Measures

Although each administration of PISA assesses reading, mathematics, and science, one of these subjects is assessed in depth. You can choose between the composite (combined scale) and/or any of the subject's subscales. However, subscales are only available for a subject area that was a major domain that year.

In 2006, science was the major domain and mathematics and reading were minor domains. Therefore, subscales are only available for science data; only single scales are available for PISA mathematics and reading. Subscales are constituent parts of the composite subject scale for an assessment. Subscales are specified by the assessment framework.

Jurisdictions

In 2006, 57 jurisdictions participated, which included all 30 Organization for Economic Cooperation and Development (OECD) countries, as well as 27 non-OECD jurisdictions. All listed jurisdictions can be selected for any analyses. However, the IDE contains a few U.S.-specific background variables (e.g., race/ethnicity) that, when selected, will not yield information for any other jurisdictions.

2. Variables

In the PISA IDE, questions from two types of questionnaires (student and school) as well as variables that are derived from background information are organized into categories that have shared characteristics and can be selected as a group when examining and generating tables.

Content category and subcategory titles may overlap, but specific variables appear only once in a subcategory. Use **Search** in the **Select Variables** step to locate variables.

3. Statistics Options

The IDE reports PISA data with several Statistics Options:

- Average scale scores
- Percentages
- Achievement levels – discrete
- Percentiles
- Standard deviations

Average scale scores

For the PISA assessment, student performance is reported on scales that range from 0 to 1,000, with the OECD combined scale average fixed at 500 and a standard deviation of 100.

Scale scores can show the standard error (in parentheses) and are often accompanied by data showing percentages and standard deviations.

PISA scales are produced using Item Response Theory (IRT) to estimate average scores for science, mathematics, and reading literacy for each jurisdiction. IRT identifies patterns of response and uses statistical models to predict the probability of answering an item correctly as a function of the students' proficiency in answering other questions. That is, student responses to the assessment questions are analyzed to determine the percentage of students responding correctly to each multiple-choice question and the percentage of students achieving each of the score categories for constructed-response questions.

Percentages

Percentages show the percentage of students as a row percentage. For example, if the table cell for Black female students in the United States is 7 percent, then Black females composed 7 percent of the total number of students assessed. By default, percentage distributions do not include those with missing data, though there is an option to include the missing.

Achievement levels (discrete)

In addition to average scale scores, achievement results for PISA are also reported using achievement levels. Discrete achievement levels are reported as the percentage of students performing at each PISA proficiency level, counted separately from the other proficiency levels. The PISA proficiency levels are based on collective judgments about what students should know and be able to do relative to the body of content reflected in each subject-area assessment. The IDE provides achievement level results only for the combined scale of the subject that is the major domain (e.g., combined science scale for PISA 2006). For science literacy, there are six PISA proficiency levels *(level 1, level 2, level 3, level 4, level 5,* and *level 6).* A seventh level *(below level 1)* was established to include students whose abilities could not be accurately described based on their responses. Descriptions were developed to characterize typical student performance at each level.

Exact cut scores for the science proficiency levels are as follows:

- below level 1, less than or equal to 334.94;
- level 1, greater than 334.94 and less than or equal to 409.54;
- level 2, greater than 409.54 and less than or equal to 484.14;
- level 3, greater than 484.14 and less than or equal to 558.73;
- level 4, greater than 558.73 and less than or equal to 633.33;
- level 5, greater than 633.33 and less than or equal to 707.93; and
- level 6, greater than 707.93.

Descriptions of competencies at the 2006 PISA proficiency levels in science appear in the following table:

Description of PISA science literacy subscales: 2006

Proficiency level	Task descriptions
Level 1	At level 1, students have such a limited scientific knowledge that it can only be applied to a few familiar situations. They should be able to present scientific explanations that are obvious and follow concretely from given evidence.
Level 2	At level 2, students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. They should be capable of direct reasoning and making literal interpretations of the results of scientific inquiry or technological problem solving.
Level 3	At level 3, students should be able to identify clearly described scientific issues in a range of contexts. They should be able to select facts and knowledge to explain phenomena and apply simple models or inquiry strategies. Students at this level should be able to interpret and use scientific concepts from different disciplines and apply them directly. They should be able to develop short communications using facts and make decisions based on scientific knowledge.
Level 4	At level 4, students should be able to work effectively with situations and issues that may involve explicit phenomena requiring them to make inferences about the role of science or technology. They should be able to select and integrate explanations from different disciplines of science or technology and link those explanations directly to aspects of life situations. Students at this level should be able to reflect on their actions and communicate decisions using scientific knowledge and evidence.
Level 5	At level 5, students should be able to identify the scientific components of many complex life situations; apply both scientific concepts and knowledge about science to these situations; and should be able to compare, select, and evaluate appropriate scientific evidence for responding to life situations. Students at this level should be able to use well-developed inquiry abilities, link knowledge appropriately, and bring critical insights to these situations. They should be able to construct evidence-based explanations and arguments based on their critical analysis.
Level 6	At level 6, students should be able to consistently identify, explain, and apply scientific knowledge and knowledge about science in a variety of complex life situations. They should be able to link different information sources and explanations and use evidence from those sources to justify decisions. They should be able to clearly and consistently demonstrate advanced scientific thinking and reasoning, and they are willing to use their scientific understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level should be able to use scientific knowledge and develop arguments in support of recommendations and decisions that center on personal, social, or global situations.

NOTE: Information about the procedures used to set the proficiency levels is available in the *PISA 2006 Technical Report*.
SOURCE: Organization for Economic Cooperation and Development, Program for International Student Assessment (PISA), 2006.

Percentiles

This statistic shows the threshold (or cutpoint) score for the following:

- 10th percentile – the bottom 10 percent of students
- 25th percentile – the bottom quarter of students
- 50th percentile – the median (half the students scored below the cutpoint and half scored above it)
- 75th percentile – the top quarter of students
- 90th percentile – the top 10 percent of students

Standard deviations

The standard deviation is a measure of how widely or narrowly dispersed scores are for a particular data set. Under general normality assumptions, 95 percent of the scores are within two standard deviations of the mean. For example, if the average score of a data set is 500 and the standard deviation is 100, it means that 95 percent of the scores in this data set fall between 300 and 700. The standard deviation is the square root of the variance.

In the IDE, you may obtain standard deviations as one of your two choices for **Statistics Options** in **Edit Reports**.

4. Cross-tabulations

Cross-tabulation is a method of combining separate variables into a single table. Normally each variable has its own table. If you have selected two or three variables (not counting **All Students**), when you go to the **Edit Reports** step, you will automatically get one table for each variable (including one for **All Students**); at the end of that list, you will get one cross-tabulation for the two or three variables selected.

If you have chosen four or more variables (not counting **All Students**), you will get tables for each variable, but you won't get the cross-tabulation.

Be advised that if you go back to add another variable without subtracting one to keep the total under four, you will lose any edits you might have made to the cross-tabulation.

5. Statistical Notations and Other Notes

Statistical notations and other notes are found at the end of a data table, as applicable to that table:

— Not available.
† Not applicable. (For instance, the statistic does not meet reporting standards, so the standard error for that statistic cannot be reported.)
# The statistic rounds to zero.

‡ Reporting standards not met. (For instance, the sample size is insufficient to permit a reliable estimate.)
NOTE: A general note pertains to any special characteristics of the data in the table.
SOURCE: Source information is listed for all PISA data and should be cited when data are used in a publication or presentation.

6. Glossary

Below is a list of technical and PISA-specific assessment terms used in the IDE.

A. Student and Family Characteristics

ISCED – The International Standard Classification of Education (ISCED) is an internationally comparable method for describing levels of education across countries, created by the United Nations Educational, Scientific and Cultural Organization (UNESCO). ISCED levels are defined as follows:

Level 0 – The initial stage of organized instruction, designed primarily to introduce very young children to a school-type environment. ISCED level 0 programs can either be center or school based. Preschool and kindergarten programs in the United States fall into the level 0 category.

Level 1 – Consists of primary education, which usually lasts 4 to 6 years. ISCED level 1 typically begins between ages 5 and 7, and is the stage where students begin to study basic subjects, such as reading, writing, and mathematics. In the United States, elementary school (grades 1 through 6) is classified as level 1.

Level 2 – Also known as lower secondary education, students continue to learn the basic subjects taught in level 1, but this level is typically more subject specific than level 1 and may be taught by specialized teachers. ISCED level 2 usually lasts between 2 and 6 years, and begins around the age of 11. Middle school and junior high (grades 7 through 9) in the United States are classified as level 2. These programs are primarily designed to prepare students for ISCED level 3.

Level 3 – Also known as upper secondary education, student coursework is generally subject specific and often taught by specialized teachers. Students often enter upper secondary education at the age of 15 or 16 and attend anywhere from 2 to 5 years. ISCED level 3 can prepare students for university, further schooling, or the labor force. Senior high school (grades 10 through 12) is considered level 3 in the United States. These programs are primarily designed to prepare students for ISCED levels 5A and 5B.

Level 4 – Consists of primarily vocational education and courses are taken after the completion of secondary school, though the content is not more advanced than the content of secondary school courses. ISCED level 4 programs in the United States are often in the form of 1-year certificate programs. These programs can prepare students for ISCED levels 5A and 5B.

Level 5 – Divided into levels 5A and 5B, this level refers to tertiary education and usually lasts 3 to 6 years. ISCED level 5A refers to academic higher education below the doctoral level. Level 5A programs are intended to provide sufficient qualifications to gain entry into advanced research programs and professions with high skill requirements. In the United States, bachelor's, master's, and first

professional degree programs are classified as ISCED level 5A. ISCED level 5B refers to vocational higher education. Level 5B programs provide a higher level of career and technical education and are designed to prepare students for the labor market. In the United States, associate's degree programs are classified at this level.

Level 6 – Refers to the doctoral level of academic higher education. Level 6 programs usually require the completion of a research thesis or dissertation.

White/Blue Collar – Students were asked to report their mothers' and fathers' occupations. The open-ended responses for occupations were then coded in accordance with the International Standard Classification of Occupations (ISCO 1988). The variables on students' fathers' and mothers' occupations were then transformed into four socio-economic categories. Examples of professions within these categories include:

White-collar high-skilled – legislators, senior officials and managers, professionals, technicians and associate professionals

White-collar low-skilled – service workers, shop and market sales workers and clerks

Blue-collar high-skilled – skilled agricultural and fishery workers and craft and related trades workers

Blue-collar low-skilled – plant and machine operators and assemblers and elementary occupations

B. School Composition and Organization

National modal grade for 15-year-olds – Each of the participating countries in PISA selects a nationally representative sample of 15-year-olds, regardless of grade level. This generally corresponds to grade 10 in the United States, but grade levels vary across countries.

Grade 13 – While schools in the United States generally end at grade 12, students in some countries begin school at an earlier age, and consequently have 13 years of primary and secondary schooling.

Ability grouping within school – Some countries have comprehensive school systems with no, or only limited, institutional differentiation. Other countries group students through tracking or streaming either between schools or between classes within schools with the aim of serving students according to their academic potential and/or interests in specific programs. In many countries combinations of the two approaches occur. This index is comprised of SC08Q01 and SC08Q02 (see below).

Streaming between classes – Grouping of students into different classes within a school, by perceived or measured academic potential and/or interests in specific programs.

Streaming within classes – Grouping of students in the same class, by perceived or measured academic potential and/or interests in specific programs.